

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF KANSAS**

**IN RE: CESSNA 208 SERIES AIRCRAFT** )  
**PRODUCTS LIABILITY LITIGATION** ) **MDL No: 1721**  
 )  
 ) **Case No: 05-md-1721-KHV**  
**(This Document Relates To All Cases)** )  
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**MEMORANDUM AND ORDER**

This matter involves several air disasters involving the Cessna 208 Series aircraft. Plaintiffs filed suit against Cessna Aircraft Company and Goodrich Corporation seeking damages for personal injuries and wrongful death. The Judicial Panel on Multidistrict Litigation (“MDL Panel”) later transferred the various actions to this Court for consolidated pretrial proceedings. This matter is before the court on Cessna Aircraft Company’s Motion In Limine to Exclude Testimony of Peter H. Hildebrand (Doc. #658) filed December 22, 2008. For reasons stated below, the Court sustains Cessna’s motion.

**Legal Standards**

Under Fed. R. Evid. 702, the trial court must act as a gatekeeper and determine at the outset, pursuant to Fed. R. Evid. 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 592 (1993). This entails a preliminary assessment whether the reasoning or methodology underlying the testimony is scientifically valid and whether that reasoning or methodology properly can be applied to the facts in issue. Id.

The Court has broad discretion in deciding whether to admit expert testimony. See Kieffer v. Weston Lands, Inc., 90 F.3d 1496, 1499 (10th Cir. 1996). Rule 702, Fed. R. Evid. provides that an expert may testify as to scientific, technical, or other specialized knowledge if (1) the testimony

is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case. The touchstone of Rule 702 is the helpfulness of expert testimony, a condition that goes primarily to relevance. See BioCore, Inc. v. Khosrowshahi, 183 F.R.D. 695, 699 (D. Kan. 1998) (quoting Miller v. Heaven, 922 F. Supp. 495, 501 (D. Kan. 1996)). Any doubts should be resolved in favor of admissibility. See id. The purpose of the Daubert inquiry is always “to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” Kumho Tire Co. v. Carmichael, 526 U.S. 137, 152 (1999).

#### **Factual Background**

Plaintiffs allege product liability claims on behalf of themselves and the estates of decedents. In particular, plaintiffs allege that ice accumulation on the Cessna 208 Caravan Aircraft was a factor in various crashes. Plaintiffs allege that Cessna and Goodrich negligently designed and/or manufactured the de-icing system on the aircraft. Plaintiffs also allege that Cessna breached express and implied warranties and fraudulently disclosed data about the aircraft certification.

Peter H. Hildebrand, one of plaintiffs’ designated experts, is a research meteorologist and the Chief of Hydrospheric and Biospheric Sciences Laboratory Processes at the NASA/Goddard Space Flight Center in Greenbelt, Maryland. See Hildebrand Report, attached as Exhibit A-1 to Cessna Aircraft Company’s Memorandum In Support Of Its Motion In Limine to Exclude The Expert Testimony of Peter H. Hildebrand (Doc. #659) filed December 22, 2008, at 18. He obtained B.A., M.S. and Ph.D. degrees in atomospheric sciences at the University of Chicago. Id. Dr. Hildebrand also has experience as a forensic weather consultant for weather conditions relating to

aircraft accidents. Id.

For purposes of this litigation, Dr. Hildebrand has developed the norm for aircraft design (“NAD”) hypothesis. The NAD hypothesis theorizes that based on years of aircraft design refinements, a norm for safe aircraft design has developed and the design of the Cessna 208B “somehow lies outside of this norm.” Id. at 1. The NAD hypothesis theorizes that if an aircraft’s characteristics are close to those of the NAD, the aircraft’s aerodynamic design is “consistent with what has been learned over many years about how to design a safe aircraft.” Id. at 2. The NAD hypothesis conversely theorizes that “if the aircraft’s characteristics fall away from the NAD, then some aspects of the aircraft’s design might be worthy of question.” Id.

In determining the NAD, Dr. Hildebrand uses data for the thrust, weight, lift and drag of an aircraft.<sup>1</sup> Id. at 1. Dr. Hildebrand does a comparative analysis of the Cessna 208B and similar types of aircraft. Id. at 2. Essentially, Dr. Hildebrand plots these data points on graphs and draws a straight “NAD” line where the average data points fall. He then determines if the Cessna 208B falls roughly along that same NAD line. Based on the NAD hypothesis, Dr. Hildebrand concludes as follows:

This norm for aircraft design (NAD) becomes obvious when aircraft characteristics such as the aircraft maximum takeoff weight and engine power are plotted against each other.

Deviations from the NAD can suggest possible design problems in the aircraft, or

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<sup>1</sup> Dr. Hildebrand relies on data in *Jane’s All the World’s Aircrafts* and *Wikipedia*. Specifically, Dr. Hildebrand uses *Jane’s* to find an aircraft’s weight (empty and maximum), engine horsepower, wing span, maximum wing loading and maximum sea level climb rate. Id. at 3-4. For four different aircraft, Dr. Hildebrand uses *Wikipedia* to find supplemental data which *Jane’s* did not provide. See id. at 7. Because *Jane’s* and *Wikipedia* do not set forth an aircraft’s thrust, lift and drag, Dr. Hildebrand uses horsepower as a proxy for thrust, maximum sea level climb rate as a proxy for lift and wing span and maximum wing loading as a proxy for drag. See id. at 3-4.

differences between aircraft.

The relationship between maximum takeoff weight and the maximum wing loading for the Cessna Caravan 208B is in good agreement with the NAD.

Using the NAD as a standard, the 208B aircraft has significantly lower horsepower than do other aircraft of similar maximum weight or maximum payload.

Using the NAD as a standard, the 208B has lower horsepower than do other aircraft with the similar wing length. These longer wings, coupled with lower horsepower could cause problems if the drag increases due to in-flight icing.

Using the NAD as a standard, the 208B has a low sea level maximum climb rate as compared with other aircraft of similar maximum takeoff weight.

Using the NAD as a standard, the 208B has a low seal level maximum climb rate as compared with other aircraft of similar engine power. This is suggestive of high drag and/or low lift.

The differences in maximum sea level climb rate between the 208 and 208B – 1234 ft/min for the 208 vs. 925 ft/min for the 208 – are in significant part due to increased drag on the 208B.

This analysis suggests that the 208B is relatively underpowered and has high drag, as compared with the NAD.

The impacts of these issues would become more severe in icing conditions.

Id. at 5.

Dr. Hildebrand concedes that his analysis only raises questions; it does not draw any conclusions as to any design defect or the relative safety of the Cessna 208B aircraft. At his deposition, Dr. Hildebrand testified as follows:

Q: And how far below the line do you need to be in order to be unsafe?

A: That's something that I can't assess. All I'm trying to do is to point out that it is below the line. . . . to state whether it's safe or not is another question, because that has to do with the application of the airplane and a whole bunch of questions like that. \* \* \*

Q: So is the only conclusion that you can draw here is the 208B compared to the

line that you visually draw is somehow below the line so it does not fall within the norm for aircraft design?

A: I didn't say it falls within or outside of. I said on the distribution of airplanes plotted about the line, it is one of the lower airplanes – lower horsepower airplanes as compared to that line. That's all I'm saying.

Q: But that says nothing about the safety of the aircraft, is that correct?

A: That per se, no. It just is an observation that compared to this norm . . . all we have here is an observation that 208B is low horsepower with respect to that.

Q: But the observation says nothing about safety is that correct?

A: Not per se. You could draw conclusions from that. But it does not, per se, say anything.

Q: Can you draw a conclusion from that?

A: Well, my conclusion would be that if you wanted an airplane to fly into known icing conditions, I would want to have 40 to 50 percent more horsepower. Not knowing anything about the airplanes, but just from the comparative statistical analysis it appears to be under power[ed].

Q: Can you draw any conclusions about the safety of the aircraft based upon this chart?

A: Not beyond what I just said. It would be an element that I would raise as an area of concern. Were I talking to a designer of airplanes and knowing that this airplane tended to fly into known icing conditions, I would say to that person you better check this out because I'm worried about the amount of horsepower in that airplane as compared to other airplanes.

Hildebrand Depo. at 108-11.

Cessna seeks to exclude Dr. Hildebrand's testimony under Daubert and Rule 702 of the Federal Rules of Evidence.

### Analysis

Before addressing Cessna's arguments, the Court addresses the precise scope of Dr. Hildebrand's opinion. Plaintiffs maintain that Dr. Hildebrand is not offering opinions on "safety" or "aerodynamics," but simply a "comparative analysis of aircraft." Plaintiffs' Response In Opposition To Defendant Cessna Aircraft Company's Motion In Limine To Exclude The Expert Testimony Of Peter Hildebrand, Ph.D. (Doc. #739) filed February 4, 2009 at 16. Plaintiffs, however, do not explain what aircraft qualities Dr. Hildebrand seeks to compare. See id. at 16 (Dr. Hildebrand does not offer opinions on safety and aerodynamics); id. at 13 (Dr. Hildebrand offers opinions on hypothesis that characteristics of Cessna 208B deviate from other aircraft models used or marketed for similar purposes). On the other hand, plaintiffs acknowledge that they offer Dr. Hildebrand's testimony to assist the jury determine whether the Cessna 208B is "defective and suitable for operation in its intended environment." See id. at 21. Dr. Hildebrand himself acknowledges that his report is a study of "aerodynamic performance" of the Cessna 208B and an attempt to determine whether the differences between the Cessna 208B and other aircraft could contribute to difficulties in flight into icing conditions. See Hildebrand Report at 1. In his report, Dr. Hildebrand opines that the Cessna 208B may have a "possible design problem" because it is relatively underpowered and has a high drag compared to the NAD and that "this issue would become more severe in icing conditions." Id. at 5. Accordingly, notwithstanding plaintiffs' disclaimer, Dr. Hildebrand does express an opinion on the relative "safety" and "aerodynamic" performance of the Cessna 208B compared to other aircraft.

Cessna argues that (1) Dr. Hildebrand's analysis based on the NAD hypothesis is not reliable

and (2) Dr. Hildebrand's testimony would not be helpful to a jury.<sup>2</sup> For purposes of Cessna's motion, the Court assumes that Dr. Hildebrand is qualified to testify. Even so, the Court finds that Dr. Hildebrand's analysis is not reliable and that his testimony would not aid the jury.

### **I. Reliability Of Dr. Hildebrand's Analysis**

Cessna argues that Dr. Hildebrand's analysis is not reliable. In determining whether an opinion or particular scientific theory is reliable, the Court may consider several nondispositive factors: (1) whether the proffered theory can and has been tested; (2) whether the theory has been subject to peer review; (3) the known or potential rate of error; and (4) the general acceptance of a methodology in the relevant scientific community. Daubert, 509 U.S. at 593-94. The Supreme Court has emphasized, however, that while a trial court may consider one or more of these factors, the test of reliability is flexible and the Daubert factors do not necessarily or exclusively apply to all experts or every case. Kumho Tire, 526 U.S. at 141. Therefore, while a trial court should consider the specific factors identified in Daubert where they are reasonable measures of the reliability of expert testimony, id., the law does not require an expert to back his opinion with independent tests that unequivocally support his or her conclusions. See Bonner v. ISP Techs, Inc., 259 F.3d 924, 929 (8th Cir. 2001); Heller v. Shaw Indus., Inc., 167 F.3d 146, 155 (3d Cir. 1999).

As part of the pretrial evaluation, the trial court must also determine whether the expert opinion is based on facts that enable the expert to express a reasonably accurate conclusion as opposed to conjecture or speculation. Kieffer, 90 F.3d at 1499 (quoting Jones v. Otis Elevator Co.,

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<sup>2</sup> Cessna also argues that Dr. Hildebrand does not possess the relevant experience and background to testify on aerodynamic analysis. Because the Court finds that Dr. Hildebrand's analysis is not reliable and that his testimony would not aid the jury, the Court need not address his qualifications.

861 F.2d 655, 662 (11th Cir. 1988)). The proponent of expert testimony must show a grounding in the methods and procedures of science which must be based on actual knowledge and not subjective belief or unaccounted speculation. Mitchell v. Gencorp, Inc., 165 F.3d 778, 780 (10th Cir. 1999).

Cessna argues that Dr. Hildebrand's methodology does not meet the Daubert test for reliable expert testimony. Cessna's argument is well taken. First, Dr. Hildebrand has not tested the NAD hypothesis to determine (1) whether basic physical characteristics of an aircraft such as engine power and maximum takeoff weight can be used to measure aerodynamic properties such as lift, drag and thrust or (2) whether aircraft which are at or close to the norm (the NAD line) are safer than those aircraft further from the norm. Dr. Hildebrand readily admits that as it relates to aircraft safety, his hypothesis is untested and inconclusive and merely raises potential areas of concern. See Hildebrand Depo. at 110-11 (would raise issue to designer as area of concern); id. at 149 (can only raise questions because analysis not "real aerodynamics . . . analysis;" analysis merely asks questions). Indeed, Dr. Hildebrand notes that an aircraft with a novel and unique aerodynamic design may be safe but not adhere to the norm. See Hildebrand Report at 2 n.1.

Second, the NAD hypothesis has not been subject to peer review and publication. See Declaration Of Michael Selig ("Selig Decl.") ¶ 9, attached as Exhibit B to Cessna Aircraft Company's Memorandum In Support Of Its Motion In Limine to Exclude The Expert Testimony of Peter H. Hildebrand (Doc. #659). The NAD hypothesis has not been publicized and Dr. Hildebrand created the theory solely for the purposes of this lawsuit. See id.; see also Daubert v. Merrell Dow Pharms., Inc., 43 F.3d 1311, 1317 (9th Cir. 1995) (on remand, court considered whether testimony based on research conducted independent of litigation or developed expressly for purpose of testifying). The theory therefore has no history of reliability.



Third, the NAD hypothesis has no known or potential rate of error. Although Dr. Hildebrand admits that his conclusions are limited, he cannot predict the degree to which his conclusions might be erroneous. See Hildebrand Depo. at 149 (analysis can only raise questions and point out possible problems with Cessna aircraft).

Finally, Dr. Hildebrand's NAD hypothesis has not been generally accepted by the scientific community. See Selig Decl. ¶ 9. For example, contrary to Dr. Hildebrand's methodology, aircraft designers do not use engine horsepower as a proxy for thrust because several other factors such as accessory operation, aerodynamic efficiency of the propeller and airspeed also contribute significantly to the thrust of an aircraft. See id., ¶¶ 19-20. Likewise, aircraft design experts do not use maximum sea level rate of climb as a measure of an airplane's aerodynamic efficiency. See id., ¶ 21. Dr. Hildebrand's statistical analysis also does not meet professional statistical standards. See Declaration Of Arnold Barnett ("Barnett Decl.") ¶ 17 (statistician would conclude that Dr. Hildebrand's analysis does not provide convincing evidence that Cessna 208/208B aircraft are more prone to accidents in icing or are otherwise unsafe in icing conditions), attached as Exhibit C to Cessna Aircraft Company's Memorandum In Support Of Its Motion In Limine to Exclude The Expert Testimony of Peter H. Hildebrand (Doc. #659); Hildebrand Depo. at 147-48 (even though statistician would consider three standard deviations from norm to be significant, he did not calculate deviations for any airplanes).

On the issues of relative "safety" and "aerodynamics," plaintiffs apparently do not dispute that Dr. Hildebrand's testimony fails to satisfy the four Daubert factors. See Plaintiffs' Response (Doc. #739) at 8 (Dr. Hildebrand repeatedly rejected any suggestion that he was offering opinions on aircraft safety or design); id. at 16 (Dr. Hildebrand does not offer opinions on safety and

aerodynamics). Plaintiffs, however, note that the Court has considerable discretion in weighing the flexible Daubert factors, see Burton v. R.J. Reynolds Tobacco Co., 183 F. Supp.2d 1308, 1311 (D. Kan. 2002), and that additional factors such as personal experience may be considered so long as the expert uses “the same level of intellectual rigor” as an expert in the relevant field. Kumho Tire, 526 U.S. at 152. Dr. Hildebrand has experience as a forensic weather consultant who specializes in analyzing and reconstructing weather conditions relating to aircraft accidents. See Hildebrand Report at 18. He has testified as an expert in that capacity in more than 50 cases. See id. Such experience, however, does not qualify him to do a comparative analysis of aerodynamics or aircraft design and safety. Dr. Hildebrand repeatedly emphasizes that his analysis is limited to raising questions. In doing so, however, he has not used “the same level of intellectual rigor” as an expert in aerodynamics, aircraft safety or statistics. See Daubert, 509 U.S. at 589-90, 593 (scientific knowledge implies grounding in methods and procedures of science; scientific method today based on generating hypotheses and testing them to see if they can be falsified); Mitchell, 165 F.3d at 783 (subject of expert testimony must be genuinely scientific as distinct from unscientific speculation offered by genuine scientist); see also Selig Decl. ¶ 8 (Dr. Hildebrand does not use scientific method to validate hypothesis). In sum, Dr. Hildebrand’s methodology and analysis are unreliable.<sup>3</sup>

## **II. Relevance Of Dr. Hildebrand’s Testimony And Helpfulness To Jury**

Cessna argues that Dr. Hildebrand’s opinions amount to speculation and conjecture and

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<sup>3</sup> Dr. Hildebrand also has used data from questionable sources. *Jane’s All the World’s Aircraft* and *Wikipedia* are not reliable sources for research on aerodynamics and aircraft design. See Selig Decl. ¶ 37. The “proxy” data which Dr. Hildebrand uses to substitute for aerodynamic data is also problematic because the variables are not as closely correlated as Dr. Hildebrand assumes. See Barnett Decl. ¶ 19. Specifically, as explained by Dr. Selig, Dr. Hildebrand’s assumptions about horsepower as a proxy for thrust, maximum sea level climb rate as a proxy for aerodynamic efficiency and the reduction in range between Cessna aircrafts are fundamentally flawed. See Selig Decl. ¶¶ 20-22.

would not help the jury. Plaintiffs note that expert opinion can only be excluded if it “is so fundamentally unsupported that it can offer no assistance to the jury.” Arkwright Mutual Ins. Co. v. Gwinner Oil Inc., et al., 125 F.3d 1176, 1183 (8th Cir. 1997) (quoting Hose v. Chicago Northwestern Transp. Co., 70 F.3d 968, 974 (8th Cir. 1995)). Plaintiffs also argue that Dr. Hildebrand need not assemble the entire case against Cessna. Even so, plaintiffs do not explain how a comparison of data for various aircraft would help the jury to decide any part of the case. Dr. Hildebrand raises questions and “possible” design defects in the Cessna 208B, but plaintiffs have not shown how these questions and possibilities would help the jury decide any particular issue in this case.

Also, Dr. Hildebrand also does not adequately explain the scientific background for his NAD hypothesis or what conclusions one can draw from his report. Dr. Hildebrand simply presents a chart of data based on the physical characteristics of various aircraft without applying that data to accident histories to determine the safety of the design of the Cessna 208B or to determine whether the aircraft has a design defect. Accordingly, Dr. Hildebrand’s testimony has a substantial potential to mislead and misinform the jury. See Barnett Decl. ¶ 17.

Dr. Hildebrand acknowledges that further analysis of accident histories or testing of the aircraft is needed to determine the safety of the design of the Cessna 208B, but he did not conduct such analysis or testing. See In re Breast Implant Litig., 11 F. Supp.2d 1217, 1231 (D. Colo. 1998) (studies recommending further studies inadequate to support expert conclusions). Absent specific facts of the relevant accident histories of the various airplanes on the charts, or aerodynamic analysis of Dr. Hildebrand’s conclusions, the Court must find that they are based on conjecture and

speculation.<sup>4</sup> See Gen. Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997) (court may conclude that analytical gap between data and opinion proffered is simply too great); Mitchell, 165 F.3d at 780 (proponent of expert testimony must show grounding in methods and procedures of science which must be based on actual knowledge and not subjective belief or unaccepted speculation). Accordingly, the Court must exclude Dr. Hildebrand's expert opinion under Fed. R. Evid. 702 and Daubert.

**IT IS THEREFORE ORDERED** that Cessna Aircraft Company's Motion In Limine to Exclude Testimony of Peter H. Hildebrand (Doc. #658) filed December 22, 2008 be and hereby is **SUSTAINED**.

Dated this 9th day of September, 2009 at Kansas City, Kansas.

s/ Kathryn H. Vratil  
KATHRYN H. VRATIL  
United States District Judge

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<sup>4</sup> Experts need not testify to a certainty. See Daubert, 509 U.S. at 590 (unreasonable to conclude that subject of scientific testimony must be known to certainty because arguably no certainties in science). At the same time, expert testimony cannot be based on mere speculation and conjecture.

Plaintiffs argue that Dr. Hildebrand is qualified by education and experience "to research basic data and plot that data in graphic form." Plaintiffs' Response (Doc. #739) at 14. Dr. Hildebrand, however, does not offer a scientific theory for analyzing the data on the graphs. A jury is left to speculate that the differences between the Cessna 208B and the NAD do not allow the Cessna 208B to operate safely in icing conditions.